ISSN 1346-7565

Acta Phytotax. Geobot. 52 (2): 103–113 (2001)

Notes on *Beilschmiedia* (Lauraceae) of Southeast Asia 1: Checklist of the Bornean Species with the Description of a New Species

SACHIKO NISHIDA

The Nagoya University Museum, Furo-cho, Chikusa-ku, Nagoya 464-8601, Japan

The taxonomy of the Lauraceae in Southeast Asia is still in confusion because of the lack of recent comprehensive revisions. In an effort to reduce this confusion, a checklist of *Beilschmiedia* in Borneo is presented. As a result, 29 accepted names of *Beilschmiedia* are recognized in Borneo, including one new species. Seventeen unpublished names are recorded on several specimens and have caused part of the confusion. Among the seventeen names, seven are identified with names already published and three are combined and used to describe a new species, *Beilschmiedia hartonoana*. Seven unpublished names could not be resolved because of an insufficient number of specimens.

Key words: *Beilschmiedia*, Borneo, checklist, Lauraceae, new species

The Lauraceae, with 2500-3000 species, contain many taxa that are ecologically or economically important (van der Werff & Richter 1996). The taxonomy of the family, however, has been in great confusion, especially in Southeast Asia. Although Southeast Asia is one of the two main centers of diversity, there has been no comprehensive revision of the species in this region since Meisner (1864). Hundreds of species have been described, combined, or transferred to different genera, but those treatments are scattered in various publications and it is hard to know their current status. Also, there are many specimens with unpublished names, some of which are in type specimen folders at several herbaria and have lead to mistake them for recongized species. To dispel this confusion, a checklist of the Lauraceae in the region has long been desirable.

I intend to revise one of the largest genera of the Lauraceae, *Beilschmiedia*, in Southeast Asia and here present a checklist of the genus in Borneo as a beginning for a checklist of the genus for all of Southeast Asia.

Beilschmiedia Nees comprises about 250 species distributed mainly in the paleotropics. It is usually distinguished from other laurel genera by its paniculate or racemose inflorescences not strictly opposite at the terminal division, bisexual and trimerous flowers with six equal to subequal tepals, six to nine fertile stamens with 2-celled anthers, and fruits lacking cupules (Nishida 1999). A molecular study reports *Cryptocarya* R.Br. and *Endiandra* R.Br. as the closest major genera (Rohwer 2000), but the former genus can be discriminated from *Beilschmiedia* by the fruit being completely enclosed in the receptacle. The latter can be distinguished by the flowers lacking the first whorl of tamens.

The genus *Beilschmiedia* was first

described by Nees in 1831. Since then about 350 names were published in the genus, including about 170 names for Asian plants. 36 species (and one variety) names are on the specimens from Borneo, of which 24 species were described from specimens collected from Borneo and 12 species from specimens collected in other regions such as Malay Peninsula or Java. Most species from Borneo were described by Merrill or Kostermans. Merrill was an American botanist and an author of many papers on the flora of the Philippines, Sumatra and Borneo (van Steenis 1950). He published a paper on specimens collected by A. D. E. Elmer from Borneo and described seven species and one variety of *Beilschmiedia* (Merrill 1929). Kostermans, a Dutch botanist, lived in Indonesia for most of his life and made great contributions to the taxonomy of Asian Lauraceae. He published about 70 species of *Beilschmiedia*, of which 16 were from Borneo (Kostermans 1955, 1960, 1962, 1965, 1968, 1970). He also wrote many new names on herbarium sheets, which he never published. I have been able to determine that Kostermans left at least 12 unpublished names for Bornean *Beilschmiedia* through annotations on specimens. A few of these names were believed to be valid and were cited in the literatures (Anderson 1980, Nagamasu & Momose 1997).

With this checklist of *Beilschmiedia* in Borneo I clarify published names, denote the type for each species, and list the unpublished names of Kostermans. Three of Kostermans's unpublished names refer to one new species, which I described here.

Materials and Methods

Specimens were borrowed from A, BO, K, L, SAR, and UC or checked on the web site of some herbaria (L, MO, U) or consulted during visits to BO, K, L, SAR. Names were checked on the web site of the International Plant Name Index, (http://www.ipni.org/) and checked against the original description.

Two alphabetical lists are provided here, one for validly published names, the other for Kostermans's unpublished names. The lists are separated to keep the unpublished names clearly from the validly published. Unpublished names are names that were not effectively published by Kostermans and include *nomina nuda* cited by other researchers without knowing they are invalid. Accepted names are in bold, synonyms and illegitimate names are in italics (all names are in italics in notes). An accepted name is a valid name of a species accepted in recent literatures although the species is not necessarily accepted by me. My current taxonomy is indicated in the notes. Accepted names are followed by reference to the protologue, the type (lectotypes are not designated here because many types are still unseen), synonyms, and sometimes notes. Names now in synonymy are followed by the correct name (connected by an equal sign), the reference, type, nomenclatural synonym, and notes. Kostermans's unpublished names are accompanied by a specimen list and a comment on their status.

Results

Thirty seven published names are recognized from Borneo in *Beilschmiedia*, of which 28 species and one variety, including one new species, are accepted. Three names are placed in synonymy, and six are transferred to a different genus. Seventeen names proposed by Kostermans through annotation on specimens have never been published.

Checklist

1. Validly published names

Beilschmiedia borneensis Merr., Pl. elmer. born.: 87. 1929 = **Beilschmiedia maingayi** Hook. f., Fl. Brit. India 5: 123. 1886.

Type. BORNEO, Sabah: vincity of Batu Lima near Sandakan, *D. D. Wood 1972* (isotype?: BO).

Beilschmiedia brachybotrys Merr., Pl. elmer. born.: 85. 1929 = **Dehaasia brachybotrys** (Merr.) Kosterm., Bot. Jahrb. Syst. 93: 429. 1973.

Type. BORNEO, Sabah: Tawao, *A. D. E. Elmer 20511* (holotype: PNH, destroyed; isotype: A).

Notes. Merrill deposited the holotype collections of his *Beilschmiedia* species at PNH. All those specimens, however, were destroyed during the Second World War (van der Werff, pers. comm.).

Beilschmiedia brachystachys Kosterm., Reinwardtia 7: 453. 1969.

Type. BORNEO, Sabah: Tawao, *A. D. E. Elmer 21851* (holotype: PNH, destroyed; isotypes: BO, K, L).

Replaced synonym. Cryptocarya brachybotrys Merr., Pl. elmer. born.: 88. 1929.

Beilschmiedia curtisii Gamble, Kew Bull.: 148. 1910.

Syntypes. MALAY PEN., Penang: on Government hill, *C. Curtis 1015* (BO, K); Singapore: in garden jungle, *H. N. Ridley 8075* (SING?).

Beilschmiedia dictyoneura Kosterm., Reinwardtia 7: 24. 1965.

Type. BORNEO, E Kalimantan: Balikpapan Distr., Sg. Wain, *A. J. G. H. Kostermans 4464* (holotype: BO; isotypes: A, BISH, BM, BRI, CANB, K, KEP, L, LE, NY, P, PNH, SAN).

Beilschmiedia elmeri Merr., Ref.: Pl. elmer. born.: 84. 1929 = **Alseodaphne oblanceolata** (Merr.) Kosterm., Reinwardtia 7: 292. 1968.

Type. BORNEO, Sabah: near Tawao, *A. D. E. Elmer 20953* (holotype: PNH, destroyed).

Beilschmiedia eusideroxylocarpa (Kosterm.) Kosterm., Reinwardtia 8: 23. 1970.

Type. BORNEO, Brunei: Belait dist., Andulau F. R. boundary rentis between Badas R. and Jelutong R., *B. E. Smythies BRUN 831* (holotype: BO; isotypes: K, L).

Basionym. Endiandra eusideroxylocarpa Kosterm., Reinwardtia 5: 348. 1960.

Beilschmiedia gemmiflora (Blume) Kosterm., J. Sci. Res. (Jakarta) 1: 115. 1952.

Type. JAVA, locality unknown (Parang?), *C. L. Blume 1325* (BO).

Basionym. Laurus gemmiflora Blume, Bijdr. fl. Ned. Ind.: 555. 1826.

Nomenclatural synonyms. Polyadenia gemmiflora Nees, Syst. laur. 576. 1836; *Daphnidium gemmiflorum* Blume, Mus. bot.: 352. 1851; *Lindera gemmiflora* Boerl., Handl. Fl. Ned. Ind. 3: 147. 1900.

Taxonomic synonym. Beilschmiedia bourdillonii Brandis, Indian Trees: 528. 1906.

Notes. Beilschmiedia bourdillonii was described from India.

Beilschmiedia glabra Kosterm., Reinwardtia 7: 22. 1965.

Type. BORNEO, E Kalimantan: Peak of Balikpapan, Beoul, *A. J. G. H. Kostermans 7313* (holotype: BO; isotypes: A, BO, BRI, CAL, L, LAE, NY, P, PNH, SING).

Notes. This species is reported from Borneo by Anderson (1980) and Kochummen (1989).

Beilschmiedia glauca S. K. Lee & L. F. Lau, Acta Phytotax. Sin. 8 (3): 193. 1963.

Type. CHINA, Hainan: Peisha Hsien, *Hainan Exped. 676* (holotype: HC).

Beilschmiedia glauciphylla Kosterm., Reinwardtia 5: 347. 1960.

Type. BORNEO, locality not indicated, *O. Beccari 686* (holotype: G; isotypes: BO, K, L, S).

Taxonomic synonym. *Beilschmiedia gynotrochioides* Kosterm.

Notes. See note under *Beilschmiedia gynotrochioides*.

Beilschmiedia gynotrochioides Kosterm., Reinwardtia 7: 292. 1968 **Beilschmiedia glauciphylla** Kosterm., Reinwardtia 5: 347. 1960.

Type. BORNEO, Sarawak: Kapit, Bt. Raya, *P. Chai S 18908* (holotype: L; isotype: BO).

Notes. The type of *Beilschmiedia glauciphylla* has glaucous leaves and the veins on the upper surface are raised. The type of *B. gynotrochioides* has non-glaucous leaves with immersed veins on the upper surface. These characters sometimes vary within a species, however, and more material is needed, especially of *B. gynotrochioides*.

Beilschmiedia kinabaluensis Kosterm., For. Serv. Indones. Div. Plann.: 27. 1955 (Reinwardtia 4: 27. 1956).

Type. BORNEO, Sabah: Mt. Kinabalu, Tenompok, *J. & M. S. Clemens 29524* (holotype: BO; isotypes: A, K, L, SING).

Notes. The original publication with the description for this name was not well-circulated. Usually, only the later description in Reinwardtia is cited.

Beilschmiedia kunstleri Gamble, Kew Bull.: 147. 1910.

Syntypes. MALAY PEN., Perak, *H. H. Kunstler 6854* (K); Singapore: Bukit Timah, *Bayliss 5885* (SING?).

Notes. This species was reported to be on Borneo by Anderson (1980) and Kochummen (1989).

Beilschmiedia longipedicellata Ridl., Kew Bull.: 475. 1926 **Dehaasia longipedicellata** (Ridl.) Kosterm., For. Serv. Indones. Div. Plann.: 37. 1955 (Reinwardtia 4: 37. 1956).

Type. MALAY PEN., Selangor: Semeniyih, *Hume 8432* (BO, SING).

Beilschmiedia longipedicellata Merr., Pl. elmer. born.: 83. 1929 (non Ridl. 1926) **Dehaasia membranacea** Kosterm., For. Serv. Indones. Div. Plann.: 37. 1955 (Reinwardtia 4: 37. 1956).

Type. BORNEO, Sabah: Tawao, *A. D. E. Elmer 20782* (holotype: PNH, destroyed; isotype: A).

Notes. This name is later homonym.

Beilschmiedia lucidula (Miq.) Kosterm., Reinwardtia 8: 23. 1970.

Type. JAVA, Banjoemas, *T. Horsfield s.n.* (holotype: L?; isotypes: BO, K, U).

Basionym. *Cryptocarya lucidula* Miq., Fl. Ned. Ind. 1: 922. 1858.

Taxonomic synonyms. *Beilschmiedia praecox* Koord. & Valet., Meded. 's Lands Plantent. 68: 195. 1904; *Endiandra sumatrana* Miq., Fl. Ned. Ind. 1: 919. 1858; *Beilschmiedia nervosa* (Elmer) Merr., Philipp. J. Sci., Bot. 5: 271. 1915; *Pygeum nervosum* Koehne, Bot. Jahrb. Syst. 52: 337. 1915; *Beilschmiedia leytensis* Merr., Philipp. J. Sci., Bot. 9: 357. 1914.

Notes. Although the holotype of this species was most likely placed at L, I have not been able to find it there. *Beilschmiedia praecox* is from Java, *Endiandra sumatrana* is from Sumatra, *Pygeum nervosum* and *B. leytensis* are from the Philippines. *Beilschmiedia lucidula* was reported from Borneo by Kochummen (1989).

Beilschmiedia lumutensis Gamble, Kew Bull.: 148. 1910.

Type. MALAY PEN., Perak: Lumut Dinding, *H. N. Ridley 10323* (K).

Beilschmiedia madang (Blume) Blume, Mus. bot.: 332. 1851.

Type. JAVA, locality unknown, *C. L. Blume 776* (BO, K, L, U).

Basionym. Laurus madang Blume, Bijdr. fl. Ned. Ind.: 555. 1826.

Notes. Kostermans (1973) assigned *Dehaasia oliviformis* Teijsm. & Binn. to *Beilschmiedia madang*, but the former species is a *nomen nudum*. This species was reported from Borneo (Sarawak) by Anderson (1980).

Beilschmiedia maingayi Hook. f., Fl. Brit. India 5: 123. 1886.

Type. MALAY PEN., Malacca, *A. C. Maingay 1268* (holotype: K).

Taxonomic synonym. Beilschmiedia borneensis Merr.

Notes. This species was reported from Borneo by Anderson (1980) and Kochummen (1989).

Beilschmiedia malaccensis (Meisn.) Hook. f., Fl. Brit. India 5: 123. 1886.

Type. MALAY PEN., Malacca, *Griffith s.n.* (K, L).

Basionym. Beilschmiedia roxburghiana Nees var. *malaccensis* Meisn. in DC., Prodr. 15: 63. 1864.

Notes. Although a collection by Maingay (no. 1260) is in the type folder for this name at K, Meisner cited only Griffith's specimen. This species appears to be intermediate between *Beilschmiedia curtisii* and *B. madang*.

Beilschmiedia micrantha Merr., Pl. elmer. born.: 85. 1929.

Type. BORNEO, Sabah: Tawao, *A. D. E. Elmer 21156* (holotype: PNH, destroyed; isotypes: BO, K, L).

Beilschmiedia micrantha Merr. var. **latifolia** Merr., Pl. elmer. born.: 86. 1929.

Type. BORNEO, Sabah: Tawao, *A. D. E. Elmer 21235* (holotype: PNH, destroyed; isotypes: BO, K, L).

Notes. This variety may not warrant recognition because leaf size in the species varies widely.

Beilschmiedia montanoides Kosterm., Reinwardtia 7: 26. 1965.

Type. BORNEO, Sabah: Ranau, *J. Singh SAN 28273* (holotype: BO; isotypes: K, L).

Beilschmiedia murutensis Kosterm., Reinwardtia 8: 25. 1970.

Type. BORNEO, Sarawak: Ba Kelalan, Lawas, Mt. Murut, *Ilias Paie S 26504* (holotype: SAR; isotypes: BO, K, L).

Beilschmiedia oblanceolata Merr., Pl. elmer. born.: 84. 1929 = **Alseodaphne oblanceolata** (Merr.) Kosterm., Reinwardtia 7: 292. 1968.

Type. BORNEO, Sabah: Tawao, *A. D. E. Elmer 20931* (holotype: PNH, destroyed; isotypes: A).

Nomenclatural synonym. Dehaasia oblanceolata (Merr.) Kosterm., For. Serv. Indones. Div. Plann.: 37 (1955) (Reinwardtia 4: 37. 1956).

Notes. Although Kostermans (1968) regarded *Elmer 20894* as a syntype of *Beilschmiedia oblanceolata*, Merrill (1929) did not cite that specimen in the protologue. This species was once placed in *Dehaasia* by Kostermans. He later transferred it to *Alseodaphne* with the comment that the type specimen had 4-celled anthers. The type, however, has 2-celled anthers and the species should be retained under *Dehaasia* if *Alseodaphne* and *Dehaasia* are kept separate.

Beilschmiedia oblonga Kosterm., Reinwardtia 7: 293. 1968.

Type. BORNEO, W Kalimantan: Melawi, Tjatit, Neth. Ind. *For. Service bb 31807* (holotype: L; isotypes: BO, K).

Beilschmiedia oligocarpa Kosterm., Reinwardtia 8: 27. 1970.

Type. BORNEO, Sarawak: Tinso Pen., *J. A. R. Anderson S 3101* (holotype: BO; isotypes: SAR, SING).

Beilschmiedia perakensis Gamble, Kew. Bull.: 149. 1910.

Syntypes. MALAY PEN., Perak: Thaiping, *H. H. Kunstler 8489* (K, L), *10026* (K), *10432* (herbarium unknown).

Notes. This species was reported from Borneo by Anderson (1980) and Kochummen (1989).

Beilschmiedia phoebeopsis Kosterm., Reinwardtia 7: 293. 1968.

Type. BORNEO, Sarawak: Bintulu, Ulu Stirau, Labang, P. *S. Ashton S 16551* (L).

Beilschmiedia pilosa Kosterm., Reinwardtia 5: 347. 1960 = **Beilschmiedia wieringae** Kosterm., For. Serv. Indones. Div. Plann.: 35. 1955 (Reinwardtia 4: 35. 1956).

Type. BORNEO, Sabah: Mt. Kinabalu, Dallas, *J. & M. S. Clemens 30235* (holotype: BO; isotypes: K, G).

Notes. The types of *Beilschmiedia pilosa* and *B. wieringae* are different from each other in leaf shape and venation pattern. Better material is needed to clarify their circumscription because the types have only very young fruits and flower buds.

Beilschmiedia reticulata Kosterm., Reinwardtia 6: 158. 1962.

Type. BORNEO, Sabah: Diwata R., 16 miles WSW of Lahad Datu, *Kadir & Japoni SAN A 1815* (holotype: SING; isotypes: BO, L).

Beilschmiedia rivularis Kosterm., Reinwardtia 7: 27. 1965.

Type. BORNEO, SE Kalimantan: Sampit Distr., Kuala Kuajan, *A. J. G. H. Kostermans 8005* (holotype BO; isotypes: BO, BRI, CAL, G, K, KEP, L, LAE, P, PNH).

Beilschmiedia tawaensis Merr., Pl. elmer. born.: 86. 1929.

Type. BORNEO, Sabah: Tawao, *A. D. E. Elmer 21885* (holotype: PNH, destroyed; isotypes: BO, K, L).

Beilschmiedia titanophylla Airy Shaw, Kew Bull.: 534. 1939 = **Dehaasia titanophylla** (Airy Shaw) Kosterm., For. Serv. Indones. Div. Plann.: 40. 1955 (Reinwardtia 4: 40. 1956).

Type. BORNEO, Sarawak: Mt. Balapau, Ulu Tinjar, *Native Collector 2438* (K, SING).

Beilschmiedia wallichiana (G. Don) Kosterm., Reinwardtia 5: 391. 1961.

Type. MALAY PEN., Penang: locality unknown, *N. Wallich 4158* (holotype: K).

Basionym. *Sideroxylon wallichianum* G. Don, Gen. Hist. 4: 28. 1838.

Beilschmiedia wieringae Kosterm., For. Serv. Indones. Div. Plann.: 35. 1955 (Reinwardtia 4: 35. 1956).

Type. BORNEO, E Kalimantan: Balikpapan Distr., Muan region near Riko R., *A. J. G.*

H. Kostermans 4374 (holotype: BO; isotypes: A, BO, K, L, PNH, SING).

Taxonomic synonym. Beilschmiedia pilosa Kosterm.

Notes. See note under *Beilschmiedia pilosa*.

2. Kostermans's unpublished names

Beilschmiedia andersonii Kosterm. nom. nud., in sched. = **Beilschmiedia rivularis** Kosterm.

Specimen. J. A. R. Anderson S 4322 (L).

Beilschmiedia cuadrae Kosterm. nom. nud., in sched. = **Beilschmiedia lumutensis** Gamble

Specimens. A. Cuadra 850 (K); *A. J. G. H. Kostermans 21418* (L); *Md. Maidin North Borneo Forestry Department 1752* (K, L).

Beilschmiedia endiandrifolia Kosterm. nom. nud. = **Beilschmiedia glauca** S. K. Lee & L. F. Lau

Ref. J. A. R. Anderson. A Checklist of Tr. Sarawak: 221. 1980.

Specimens. F. H. Endert 4481 (L); *A. J. G. H. Kostermans 7436* (A), *7448* (A, L), *7602* (L), *7611* (A, BO, L); *I. Paie 13330* (SAR); *anonymous* (*Coll. 000 H. L. B; L 0278716*) (L).

Beilschmiedia impressicosta Kosterm. nom. nud., in sched.

Specimens. C. E. Carr SFN 27186 (L); *W. L. Chew & E. J. H. Corner RSNB 7027* (L); *J. & M. S. Clemens 29308* (K); *G. Mikil 56296* (L).

Notes. Specimens with this name perhaps represent a new species. However, further study is needed to discriminate them from *Beilschmiedia brachybotrys*.

Beilschmiedia jacobsii Kosterm. nom. nud., in sched.

Specimens. e. a. ff. 969 (K); *M. Jacobs 5029* (K, L); *5104* (L); *A. Muas 13463* (L); *Nat. Coll. 129* (K); *Banyeng & Sibat S 24928* (L); *Banyeng & Benang S 26243* (K, L); *I. Paie S 16958* (L); *H. Winkler 1255* (L).

Notes. Specimens with this name represent a new species as described below.

Beilschmiedia laevifolia Kosterm. nom. nud., in sched. **Beilschmiedia kinabaluensis** Kosterm.

Specimen. J & M. S. Clemens 31582 (BO).

Notes. The specimen cited above is a paratype of *Beilschmiedia kinabaluensis*.

Beilschmiedia mersingae Kosterm. nom. nud., in sched.

Specimens. J. A. R. Anderson & I. Paie S 28262 (L); *Sibat ak Luang S 21757* (L), *21919* (L), *22545* (L).

Notes. Specimens with this name apparently represent a new species but it is too early to describe it for lack of flowering material.

Beilschmiedia micranthopsis Kosterm. nom. nud., in sched.

Specimens. Galau S 15643 (BO); *A. J. G. H. Kostermans 8733* (L), *8920* (L), *9114* (L); *Neth. Ind. For. Service bb. 29050* (L), *29335* (L); *Soepadmo & Chai S 28194* (L).

Notes. Specimens with this name are somewhat similar to the Javanese species, *Beilschmiedia rufolanata* Kosterm., but further study is needed to clarify their status. More material of B. *rufolanata* is needed.

Beilschmiedia muricata Kosterm. nom. nud., in sched. (non Hung T. Chang. 1960)

Specimen. I. Paie S 19254 (K, L).

Notes. Specimens with this name approach *Beilschmiedia rivularis*, but it is difficult to clarify their status with only fruiting material.

Beilschmiedia palimasensis Kosterm. nom. nud., in sched.

Specimen. A. J. G. H. Kostermans 13147 (L).

Notes. There is only one sterile collection with this name, it is difficult to determine if it belongs to *Beilschmiedia* or not.

Beilschmiedia pauciflora Kosterm. nom. nud., in sched.

Specimens. J. K. Lajangah SAN 44514 (L); *S. Lantoh SAN 73254* (L); *Sibat ak Luang S 21877* (L), *21886* (L), *22158* (L).

Notes. Specimens with this name apparently represent a new species, but further study is needed to compare them with *Beilschmiedia wieringae*.

Beilschmiedia pulverulenta Kosterm. nom. nud., in sched.

Specimens. M. Jacobs 5104 (SAR), *5029* (SAR); *I. Paie S 16958* (BO).

Notes. Specimens with this name are the same as *Beilschmiedia jacobsii* Kosterm. nom. nud., which is described as new below.

Beilschmiedia pulchrinervia Kosterm. nom. nud., in sched.

Specimen. S. ak Luang S 24572 (L).

Notes. Specimens with this name are the same as *Beilschmiedia jacobsii* Kosterm. nom. nud., and *B. pulverulenta* Kosterm. nom. nud., which is described as new below.

Beilschmiedia rosea Kosterm. nom. nud., in sched.

Specimens. P. S. Ashton S 18605 (L); *A. J. G. H. Kostermans 9798* (L); *W. Meijer 2588* (L).

Notes. specimens with this name are similar to *Beilschmiedia brachybotrys*, but more material is needed to clarify their status.

Beilschmiedia splendens Kosterm. nom. nud., in sched. = **Beilschmiedia dictyoneura** Kosterm.

Specimens. A. J. G. H. Kostermans 4048 (A), *4524* (A).

Beilschmiedia tenuifolia Kosterm. nom. nud., in sched. **Beilschmiedia rivularis** Kosterm.

Specimens. C. Charington SAN 22247 (L); *A. Gibot SAN 32515* (L); *W. Meijer SAN 19408* (L); *Mostyn SAN 54419* (L); *J. Ah. Wing SAN 35367* (K).

Beilschmiedia turfosa Kosterm. nom. nud. = **Beilschmiedia curtisii** Gamble

Ref. Nagamasu, H. & K. Momose. General flowering of tropical rainforests in Sarawak: 43. 1997.

Specimen. J. A. R. Anderson 12408 (SAR).

Description of a new species

Beilschmiedia hartonoana Sach. Nishida, **sp. nov.** (Fig. 1)

Beilshmiediae micranthae et *B. tawaensi* affinis, sed a priore nervis utrinque prominentibus et fructu ellipsoideo, a posteriore pilis minutis et costa prominenti differt.

Type. MALAYSIA, Sarawak: 1st div., N slopes of Mt. Penrissen (S of Kuching), approx. 1°5' N, 110°15' E, primary forest on sandstone substratum, alt. 100-1100 m, 3 Aug. 1958 (fl.), *M. Jacobs 5029* (holotype: L; isotypes: B, G, K, S, SAR, US).

Small trees, usually to 8 m tall (rarely to 18 m tall). Twigs terete, slightly angular when young, brown, pubescent with brown to reddish brown, erect, minute, curly hairs (appearing dusty with the unaided eye); buds ovoid, brown, pubescent with same hairs as on twigs. Leaves alternate, evenly arranged; petiole 1.2-1.5 cm long, flat to rounded above, rounded below, drying brown, pubescent with same hairs as on twigs; blade chartaceous to firmly chartaceous, almost glabrous, matt, elliptic, 16-26 (-31) x 8-10 (-13) cm; base cuneate, apex acuminate,

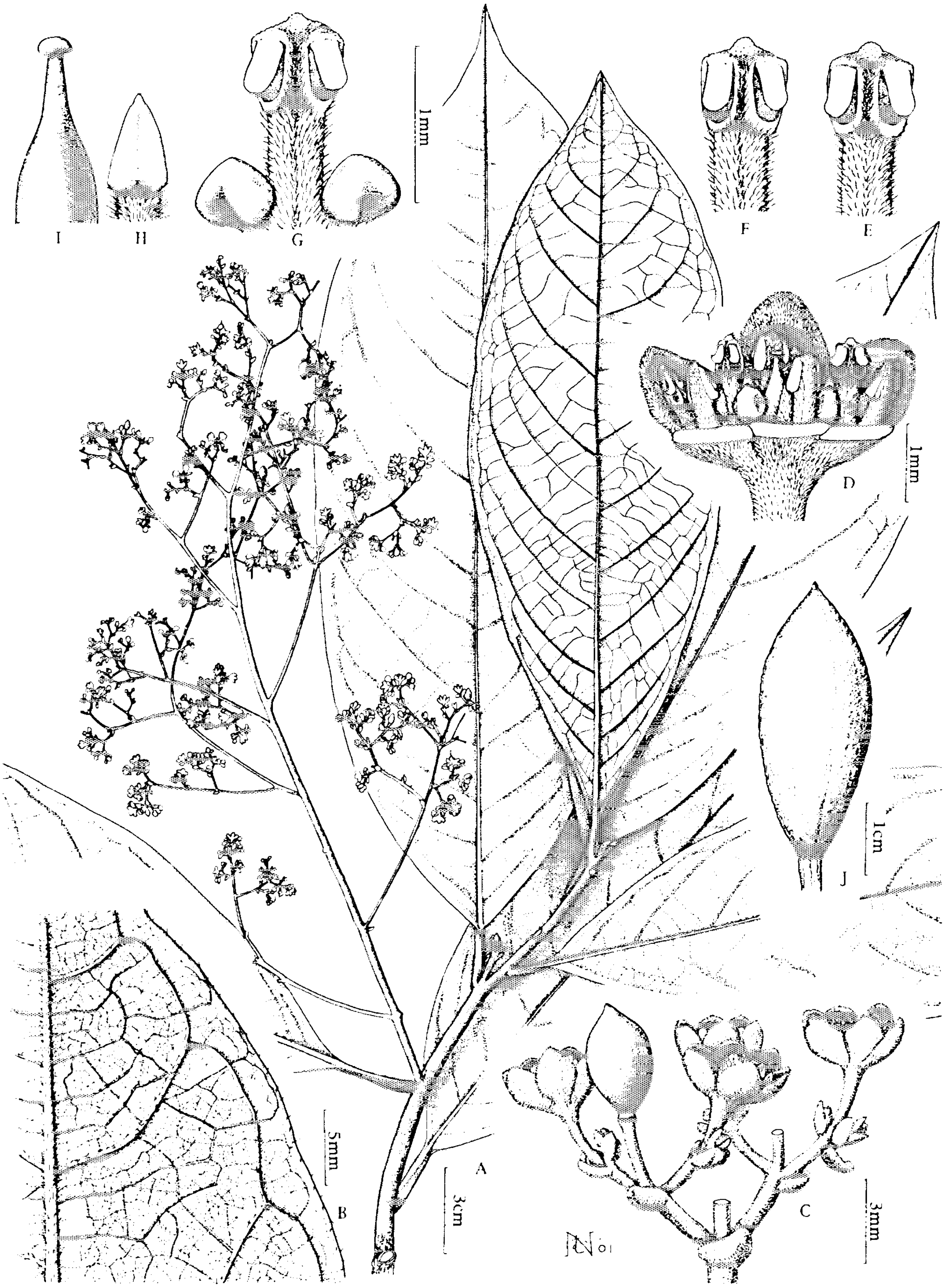

FIG. 1. *Beilschmiedia hartonoana*. A-I (*Jacobs 5029*), J (*Banyeng & Benang S 26243*). A, twig with inflorescence; B, venation pattern; C, close up of inflorescence near the apex; D, flower (front tepals removed); E, first whorl stamen (introrse); F, second whorl stamen (introrse); G, third whorl stamen with glands (extrorse); H, staminode; I, pistil; J, fruit.

margin entire and not recurved; midrib slightly raised above, raised below; secondary veins 9-11 (-13) pairs, mostly immersed above, raised below; tertiary veins weakly percurrent; minor venation relatively fine, slightly raised on both surfaces. Inflorescences axillary, paniculate, 12-45 cm long, pubescent with same hairs as on twigs, each bearing ca. 100 or more flowers; pedicel ca. 3 mm long. Flowers reddish, ca. 2.5 mm long, ca. 3 mm in diam.; tepals 6, equal, ovate, ca. 2 x 1 mm, outside pubescent with same hairs as on twigs, inside pubescent with longer hairs; stamens 9, ca. 1.3 mm long, first and second whorls introrse, third whorl extrorse or rarely latrorse, filaments of first and second whorls slightly shorter than anthers, filaments of third whorl slightly longer than anthers, all filaments pubescent with long wavy hairs, anther obtuse at apex, glabrous or sparsely pubescent at tip; staminodes 3, sagittate; pistil glabrous, ovary ovoid, ca. 0.6 mm long, style ca. 0.7 mm long; receptacle shallow, pubescent with wavy hairs. Infructescences ca. 15 cm long, each usually bearing one fruit; fruiting pedicel ca. 1.5 mm in diam., not constricted at apex. Fruits ellipsoid, ca. 4 x 1.5 cm, drying brown, surface smooth or slightly warty.

Distribution. BORNEO, Sarawak : Malaysia, and West Kalimantan, Indonesia.

Habitat. In primary mixed dipterocarp forests in lowlands or hillsides to 600m (rarely to 1200m), usually on sandstone or clay soil.

Other specimens examined. **MALAYSIA, Sarawak**: Kuching, Semengoh Arboretum, *Banyeng & Sibat S 24928* (fl.) (L, SAR); *Banyeng & Benang S 26243* (fl. & fr.) (K, L, SAR); *Haji. Bujang S 32508* (fl.) (L, SAR); *Othman Ismawi S 32988* (fl.) (SAR); *Yii & Salang S 44070* (fl.) (L). S of Kuching, N of Mt. Penrissen, *M. Jacobs 5104* (fl.) (L, SAR). Lingga, Mt. Lesung, *C. Hansen 1022* (fl.) (L, SAR). Bintulu, *Sibat ak Luang S 24572* (fl.) (L). Sadong, *A. Muas 13463* (fl.) (L). Serian, Sabal Tapang Forest Reserve, *Ilias Paie S 16958* (fl.) (BO, L, SAR). Sr. Aman, *Ilias Paie S 42473* (fl.) (L, SAR). **INDONESIA, W Kalimantan**: Kabupaten Sanggau, *W. de Jong 787* (fl.) (L). Katingan R., Bukit Raya, *H. Wiriandinata 3507* (fl) (L). Ketapang, Mt. Palung National Park, *v. Balgooy & v. Setten 5369* (fl.) (L), *5464* (fl.) (A, L), *5620* (fl.) (L); *T. G. Laman et al. 26* (fl.) (A, L), *678* (fl.) (A, L). Mt. Bentuang, *J. S. Burley et al. 2598* (fl. & young fr.) (A, L), *2761* (fl.) (L), *3164* (fl.) (A, L). Serawai, *A. C. Church et al. 2770* (fl.) (A); *H. Winkler 1255* (fl.) (L). Nr. Juwoi Ulu, *C. O. Webb 3631* (fl.) (L). Sintang, Bukit Baka National Park, *A. C. Church et al. 90* (fl.) (A, K, KEP, L), *233* (fl.) (A, K, L), *823* (fl.) (A, L).

This was an undescribed species that was annotated as "*Beilschmiedia jacobsii*, " "*B. pulverulenta*," or "*B. pulchrinervia*" by Kostermans. Sometimes two of these unpublished names are on the same specimen. To avoid confusion, I rejected those names and used Kostermans's Indonesian name, Ahmad Jahya Goh Hartono Kostermans as the basis for the epithet (his Dutch name was already used for another species, *Beilschmiedia kostermansiana* Robyns & Wilczek).

Beilschmiedia hartonoana has long inflorescenses with more than 100 small flowers, which implies an affinity with *B. micrantha* and *B. tawaensis*. Additionally, *B. micrantha* is similar to *B. hartonoana* in indument type on the buds and twigs; *B. tawaensis* is similar in fruit shape. The former species, however, has completely immersed venation and spherical fruits and the latter has long hairs and impressed midribs, which discriminate those species from *B. hartonoana*.

I am grateful to the herbaria A, BO, K, L, SAR, and UC for allowing me to study their specimens. Dr. H. Nagamasu is thanked for his critical and helpful comments. Ms. M. Nakajima prepared the excellent illustration. This study was partly supported by grants from the Ministry of Education, Science and

Culture, Japan (#09NP1501 and 10041169).

References

Anderson, J. A. R. 1980. A Checklist of the Trees of Sarawak, Vanguard Press Sdn. Bhd., Kuching, Sarawak.

Kochummen, K. M. 1989. Lauraceae. pp. 98-178. *In* Ng, F. S. P. & D. Phil (eds.), Tree Flora of Malaya vol. 4. Longman Malaysia, Selangor Darul Ehsan.

Kostermans, A. J. G. H. 1955. New and critical Malaysian plants IV. For. Serv. Indones. Div. Plann.: 1-40 [1956. Reinwardtia 4: 35].

——. 1960. New and critical Malaysian plants VI. Reinwardtia 5: 341-369.

——. 1962. Miscellaneous botanical notes 3. Reinwardtia 6: 155-187.

——. 1965. New and critical Malaysian plants VII. Reinwardtia 7: 19-46.

——. 1968. Materials for a revision of Lauraceae I. Reinwardtia 7: 291-356.

——. 1970. Materials for a revision of Lauraceae III. Reinwardtia 8: 21-196.

——. 1973. A synopsis of the genus *Dehaasia* Bl. (Lauraceae). Bot. Jahrb. Syst. 93: 424-480.

Meisner, C. F. 1864. Lauraceae. pp. 1-260. *In* A. P. De Candolle, Prodromus Systematis Naturalis Regni Vegetabilis, vol. 15, Treuttel & Wurtz, Paris.

Merrill, E. D. 1929. Plantae Elmerianae Borneenses. University of California Press, Berkeley, California.

Nagamasu, H. & K. Momose. 1997. Flora of Lambir Hills National Park, Sarawak, with special reference to the Canopy Biology Plot. pp. 20-67. *In* Inoue, T. & A. A. Hamid (eds.), General flowering of tropical rainforests in Sarawak. Center for Ecological Research, Kyoto University, Kyoto (the report of Monbusho International Scientific Research Program: Field Research, FY 1994-1996).

Nishida, S. 1999. Revision of *Beilschmiedia* (Lauraceae) in the Neotropics. Ann. Missouri Bot. Gard. 86: 651-701.

Rohwer, J. G. 2000. Toward a phylogenetic Classification of the Lauraceae: evidence from *matK* sequences. Syst. Bot. 25: 60-71.

Steens, C. F. F. J. van. 1950. Illustrated alphabetical list of the collectors. Flora Malesiana 1: 5-606.

Werff, H. van der & H. G. Richter. 1996. Toward an improved classification of Lauraceae. Ann. Missouri Bot. Gard. 83: 409-418.

Received May 7, 2001; accepted September 5, 2001